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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/327,713	06/08/1999	KIMIHIKO NISHIOKA	PM260332	5810
909	7590	12/27/2005	EXAMINER	
PILLSBURY WINTHROP SHAW PITTMAN, LLP			CHIEN, LUCY P	
P.O. BOX 10500			ART UNIT	
MCLEAN, VA 22102			PAPER NUMBER	
			2871	

DATE MAILED: 12/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/327,713

Applicant(s)

NISHIOKA, KIMIHIKO

Examiner

Lucy P. Chien

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 37-43, 48, 49, 77, 78 and 84-91 is/are pending in the application.
- 4a) Of the above claim(s) 1-36, 44-47, 50-76 and 79-83 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 37-43, 48, 49, 77, 78 and 84-91 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 June 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1/10/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/9/2005 has been entered.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 37-39 are rejected under 35 U.S.C. 102(b) as being anticipated by Smither (US 5004319).

Regarding Claim 37,

The reference shows in figure 1, 5a or b and 9 a variable optical-property mirror unit comprising (the device interacts with photons (which are infrared light also silicon crystals reflect infrared light (Column 5, Rows 50-55)) in a reflective manner): a variable optical-property mirror 71 comprising a rotationally asymmetric reflecting surface (the top) which has a length thereof along a first direction being different from a length thereof along a second direction and is therefore not symmetric on a 90 degree rotation (rotationally symmetric is taken as no change under any rotation. i.e. circular); and a

Art Unit: 2871

driving circuit constructed and arranged to drive the variable optical-property mirror, wherein the variable optical-property mirror is arranged to be decentered, wherein the variable optical-property mirror itself is made physically changeable by the driving circuit (the computer shown as 124 is indicated as controlling the elements of the driving matrix of thin film resistors by electrical elements, and hence must inherently be a drive circuit), and wherein the reflecting surface of the variable optical-property mirror contributes to forming a two-dimensional image (the relationship "contributes" is intended use and further only requires tangential association with the forming of a two dimensional image, and as it therefore met by essentially anything. Here one could use the device to create a two dimensional image of the diffracted photons).

Regarding claim 38, the reference shows the variable optical-property mirror according to claim 37, wherein a shape of the reflecting surface of said variable optical-property mirror unit is variable, as the shape is indicated as changing (see column 2, lines 39-50).

Regarding claim 39, the reference shows a variable optical-property mirror unit according to claim 37, wherein the light deflection property of said rejecting surface is rotationally asymmetric (the reflection is focus differently in both 90 degree rotation as the radius of curvature shown is different).

Claims 40 are rejected under 35 U.S.C. 102(e) as being anticipated by Gelbart 6147789.

Regarding claim 40

The reference shows an optical apparatus comprising: a variable optical-property mirror having a reflecting surface 2, a length thereof along a first direction being longer than a length thereof along a second direction (any of the elements in figure 2. or the combination of those elements, wherein the variable optical-property mirror is arranged to be decentered from a light incident-side optical axis (it is shown decentered wherein the variable optical-property mirror itself is physically changeable (it bends) and wherein the two-dimensional image is formed by the reflecting surface of the variable optical-property mirror (the use is mentioned where creating a two dimensional image is known in the art (column 4, lines 5-11)).

Claims 41,49,87,89,90 are rejected under 35 U.S.C. 102(b) as being anticipated by Koyama et al 5793473.

Regarding claim 41, the reference shows an optical device comprising:

a variable optical-property element (figure 4, element 8),.

and an optical element having a plurality of rotationally asymmetric surfaces element 7, both sides), and having a light-deflecting function (the surface of element 7 onto a semiconductor wafer is coated with a photoresist, or a glass plate, a projection optical system with a high resolution is used (Column 1, Rows 25-30)). A wafer has light deflecting functions; it bends or reflects light especially if it's a projection optical system or made of a glass plate. And wherein the variable optical-property element has an

Art Unit: 2871

optical surface, a light deflecting function of the optical surface itself being changeable (DMD devices are physically change in that they deform) and wherein the variable optical-property element contributes to forming a two-dimensional image (the device is a projector-see summary of invention column 1, lines 60-69 and throughout).

Regarding claim 49, the reference shows an optical system comprising:

a variable optical-property mirror which is physically changeable figure 6-element 20, and an optical element having a light-deflecting function and disposed at the front side or the back side which has a rotationally asymmetric surface 7 having a shape that defines only one plane of symmetry or no plane of symmetry (one of the two 90 degree directions is not symmetrical, the only possible symmetry is the other that faces across the page).

Regarding claim 87, the reference shows an optical device comprising: variable optical-property element 20, which is physically changeable, and an optical element having a plurality of rotationally asymmetric surfaces (7 - both sides are asymmetric - the front and the back) and having a light-deflecting function.

Regarding Claim 89.

a variable optical-property mirror which is physically changeable 20, and an optical element with a rotationally asymmetric surface 7 having a light-deflecting function arranged in at least in one of a position in front of the variable optical- property mirror and a position behind the variable optical- property mirror, and wherein the variable

Art Unit: 2871

optical-property element contributes to forming of a two-dimensional image (the device is a projector-see summary of invention column 1, lines 60-69 and throughout).

Regarding claim 90, the reference shows an optical system comprising:

a variable optical-property mirror which is physically changeable 20, and an optical element with a rotationally asymmetric surface 7 having a light-deflecting function arranged in at least in one of a position in front of the variable optical- property mirror and a position behind the variable optical- property mirror, and wherein the variable optical- property mirror includes no mirror or optical element array (the mirror is not shown as sub divided).

Claims 77-78 and 91 are rejected under 35 U.S.C. 102(b) as being anticipated by Pepper 5046824.

The reference shows regarding claim 77 all of the elements of the reference including an optical apparatus, comprising an optical element (the optical relay); and a plurality of variable optical-property elements (2.8 and 14- Liquid crystal devices are physically changeable in that the state is changed through the movement of molecules), wherein each of the variable optical-property elements are arranged to be decentered (the reflection is not down the center axis) from a light-incident-side optical axis, wherein each of the variable optical-property elements has an optical surface, a shape of the optical surface being changeable and wherein the variable optical-property elements contribute to forming a two-dimensional image (this limitation is only intended use and is met by anything that can be used at least tangentially in forming an image. As an image

Art Unit: 2871

imaging is indicated in figure 3, this unambiguously can be used in such a manner as the elements are used in such a manner.

The reference shows regarding claim 78 an optical apparatus according to claim 77, further comprising an image sensor (element 96 is a detector which is interpreted to be an image sensor in accordance with column 2, lines 61-65 "the output image received by the detector". Further, any of the photoconductors of the light valves can be construed as image detectors, in that they inherently produce a voltage response in each point in the image).

The reference show regarding claim 91 including an optical apparatus comprising: an optical element 34, and a plurality of variable optical-property elements which has an optical surface, a shape of the optical surface being changeable (2. 8 and 14) wherein each of the variable optical-property elements are arranged to be decentered from a light-incident-side optical axis (the reflection is off center axis), and wherein each of the variable optical-property elements form no optical element array (they are not immediately along side of each other in a matrix form.

Claims 84-86 and 88 are rejected under 35 U.S.C. 102(b) as being anticipated by Molstrom 3923370.

Regarding claim 84, the reference shows an optical device comprising: physically changeable variable optical-property element has an optical surface, a light-deflecting function of the optical surface itself being changeable (the human eye 82 is a physically

Art Unit: 2871

changeable optical element in that the human lens varies and the eyeball can move) and a rotationally asymmetric reflecting surface (mirror 30 is described as parabolic and as illustrated doesn't include the apex in the center so is asymmetric), and wherein the variable optical-property element and the rotationally asymmetric reflecting surface are arranged to be decentered from one another (the reflection off mirror 30 is decentered).

Regarding claim 85, the reference shows an optical device according to claim 84, wherein the rotationally asymmetric reflecting surface defines only one plane of symmetry or no plane of symmetry (since the side view shows no rotational plane of symmetry, only the other plane can be a plane of symmetry)

Regarding claim 86, the reference shows an optical device according to claim 84, Wherein the variable optical-property element is a reflection-type element.

Regarding claim 88, the reference shows an optical apparatus comprising a variable optical-property element (the eye), and an optical element having a rotationally asymmetric reflecting surface (the mirror 30, wherein the rotationally asymmetric reflecting surface is arranged to be decentered (the mirror 30 is used in a decentered reflection), wherein the variable optical-property element has an optical surface, a light-deflecting function of the optical surface itself being changeable (an eye has a variable lens, and wherein the rotationally asymmetric reflecting surface includes no mirror array (there is no regular set of asymmetric surfaces shown).

Art Unit: 2871

Claims 41, 43, 84, 86 and 88 are rejected under 35 U.S.C. 102(b) as being anticipated by Rambauske 3950079.

Regarding claim 84, the reference shows an optical device comprising: a physically changeable variable optical-property element 14 (elements 12,14,16 and 18 are mirrors which rotate. 12 and 14 relative to each other and therefore any of them can be considered physically variable in respect to the other) has an optical surface, a light-deflecting function of the optical surface and a rotationally asymmetric reflecting surface 12 fit's hyperbolic, see fig. 2), and wherein the variable optical-property element and the rotationally asymmetric reflecting surface are arranged to be decentered from one another (all the reflections are non central axis- see figure 2).

Regarding claim 86 the reference shows an optical device according to claim 84, wherein the variable optical-property element is a reflection-type element - the element is a reflector.

Regarding claim 88, the reference shows an optical apparatus comprising a variable optical-property element the rotatable mirror 14, and an optical element having a rotationally asymmetric reflecting surface (the mirror 12), wherein the rotationally asymmetric reflecting surface is arranged to be decentered (the mirrors are used in off axis) from a light-incident-side optical axis, wherein the variable optical-property element has an optical surface, a light-deflecting function of the optical surface itself being changeable (motion or movement is physical change) and wherein the rotationally

Art Unit: 2871

asymmetric reflecting surface forms no mirror array (there is no regular set of asymmetric surfaces shown).

Regarding claim 43, the reference shows an optical system, consisting of: rotationally asymmetric surface 12 having a light-deflecting function and a variable optical-property mirror 14 has an optical surface, a light-deflecting function of the optical surface itself being changeable (see discussion above regarding physical changeability).

Regarding claim 41, the reference shows an optical device comprising: a variable optical-property element 14 as per discussion above; and an optical element having a plurality of rotationally asymmetric surfaces and having a light-deflecting function (element 12, both sides). Wherein the variable optical-property element has an optical surface, a light-deflecting function of the optical surface itself is physically changeable (it moves) and wherein the variable optical-property element contributes to forming a two-dimensional image (an intended use limitation which is met by anything that can contribute to forming a two dimensional image, no matter how tangential the contribution is. Here the use is for steering a laser, and as the laser can be steered to form an image, the intended use limitation is met).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2871

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 42,43,48 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Koyama et al 5793473 in view of Pepper 5046824.

Koyama et al does not disclose the use of a image sensor.

Pepper discloses the device of claim 42, further comprising an image sensor (element 96 is a detector which is interpreted to be an image sensor in accordance with column 2, lines 61-65 "the output image received by the detector" to correct wavefront aberrations in input laser beams (Column 1, Row 18-19).

It would have been obvious to one of ordinary skilled in the art to modify Koyama et al's display to include Pepper's image sensor motivated by the desire to correct wavefront aberrations in input laser beams (Column 1, Row 18-19).

Regarding claim 43, In addition to Koyama et al and Pepper as disclosed above, Koyama discloses an optical system, consisting of: a rotationally asymmetric surface 7 having a light-deflecting function; and a variable optical-property mirror 8 has an optical surface, a light-deflecting function of the optical surface itself being changeable.

Regarding claim 48, In addition to Koyama et al and Pepper as disclosed above, Koyama discloses an optical device according to 41, wherein each of said variable optical-property mirror has an optical surface, a light-deflecting function of the optical

Art Unit: 2871

surface itself being changeable and an image sensor is disposed on a surface of said optical element with a plurality of rotationally asymmetric surfaces.

Response to Arguments

Applicant's arguments filed 8/19/2005 have been fully considered but they are not persuasive.

Regarding Claim 37-39,

Applicant's argument that Smither is silent about "a reflecting surface of the variable optical-property mirror that reflects visual light and near-infrared light and contributes to forming a two dimensional image." Smither discloses "Mirrors (it involves interacting with light) have been used in these instruments to direct and to focus beams of photons because they can be fabricated in various curvatures, thereby providing precise control over the direction and shape of the beams." Photons include infrared light. Also, silicon crystals reflect infrared light discloses (Column 5, Rows 50-55). Moreover, the relationship "contributes" is intended use and further only requires tangential association with the forming of a two dimensional image, and as it therefore met by essentially anything. Here one could use the device to create a two dimensional image of the diffracted photons.

The argument that "Smither merely discloses a crystal diffraction lens (it involves interacting with light)" A crystal diffraction lens is a variable optical property element (it involves interacting with light). Smither discloses all features disclosed in Claims 37-39. (Also see above rejection)

Regarding Claim 40,

Art Unit: 2871

Applicant's argument that Gelbart is silent about ""an apparatus including a variable optical-property mirror (it involves interacting with light) wherein a two-dimensional image is formed by the reflecting surface of the variable optical-property mirror." Smither discloses the use is mentioned where creating a two-dimensional image is known in the art (column 4, lines 5-11).

The argument that Gelbart merely discloses "a deformable mirror " A variable optical-property mirror is a deformable mirrors (it involves interacting with light). Gelbart discloses every feature in Claim 40. (see above rejection)

Regarding **Claim 41-43,48-49,87 and 90**, Koyama et al discloses (the surface of element 7 onto a semiconductor wafer is coated with a photoresist, or a glass plate, a projection optical system with a high resolution is used (Column 1, Rows 25-30)). Therefore, the wafer has light deflecting functions; it bends or reflects light especially if it's a projection optical system or made of a glass plate. The rejection to Claim 41-43,48-49,87 and 90 are proper.

Regarding Claim 77-78, and 91, Applicants Argument's of Pepper discloses "a liquid crystal light valve and comprising a liquid crystal layer and a photoconductive substrate layer" Pepper does disclose a liquid crystal which is an optical element (it involves interacting with light) because as disclosed above in the rejection the liquid crystal device is physically changeable in that the state is changed through the movement of molecules. Pepper discloses all of Claim 77-78, and 91.

Regarding Claims 84-85 and 88, Applicants argument " Moldstrom does not disclose, teach or suggest an optical device including these features." A physically changeable variable optical-property element (definition of optical property element: it

Art Unit: 2871

includes interacting with light) is a human eye which interacts with light and is physically changeable (see rejection above). Moldstrom discloses everything in Claims 84-85 and 88.

Claim 89 was inadvertently overlooked and is now included in this office action.

Regarding Claims 41, 43, 84, 86 and 88 Applicant argues that Rambauske is silent about "a variable optical-property element that has an optical surface, a light-deflecting function of the optical surface itself being changeable" However, Rambauske does disclose catoptric arrangement which includes mirrors which is a variable-optical-property element because it interacts with light which is a definition of an optical property element.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lucy P. Chien whose telephone number is 571-272-8579. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571)272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lucy Chien
Examiner
Art Unit 2871


ANDREW SCHECHTER
PRIMARY EXAMINER